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### RECORD OF REVISIONS

Rev	Date	Description	POC	OIC
0	8/16/04	Initial issue.	Kelly Bingham, <i>FWO-DECS</i>	Gurinder Grewal, <i>FWO-DO</i>

**Contact the Responsible Engineering Standards POC  
for upkeep, interpretation, and variance issues**

<b>GWS 1-04</b>	<b>Welding POC</b> <a href="http://www.lanl.gov/f6stds/pubf6stds/engrman/HTML/poc_techcom1.htm#weld">http://www.lanl.gov/f6stds/pubf6stds/engrman/HTML/poc_techcom1.htm#weld</a>
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## **GWS 1-04 WELDING PROCEDURE QUALIFICATION TESTS & RECORDS**

### **1.0 PURPOSE AND SCOPE**

- A. The purpose of this procedure is to establish the responsibilities, methods, and requirements for conducting welding procedure qualification testing.
- B. The scope of this section is qualification of welding procedures conducted in support of the LANL Welding Program. This section also applies for demonstration of standard welding procedure specifications when required by referenced codes.

### **2.0 REFERENCES**

- 1. ASME Section IX, *Welding and Brazing Qualifications*
- 2. AWS D1.1, *Structural Welding Code*
- 3. API-1104, *Welding of Pipelines and Related Facilities*

### **3.0 ACRONYMS AND DEFINITIONS**

<b>Acronym / Term</b>	<b>Description</b>
<b>Procedure Qualification Record (PQR)</b>	A record of the welding data used to weld a test coupon for qualification of a welding procedure, including the variables recorded during welding of the test coupon and the test results of the tested specimens.
<b>PQT</b>	Procedure Qualification Traveler
<b>SWPS</b>	Standard Welding Procedure Specification (ASME Section IX WPS)

### **4.0 GENERAL**

#### **4.1 Responsibilities**

- A. The **LANL Welding Program Administrator (WPA)** has overall responsibility for qualification of LANL welding procedures, including preparation and certification of Welding Procedure Qualification Travelers and Welding Procedure Qualification Records.  
**Note:** The LANL WPA may utilize the support of the Support Services Subcontractor (SSS) for implementing selected activities of the LANL Welding Program.
- B. The **LANL WPA** is responsible for ensuring that adequate facilities, tools, and equipment are provided when procedure qualification activities are conducted on or off site.
- C. The **LANL PS-1 Institutional Quality Management Group (IQMG)** is responsible for audits and surveillances to assure compliance to theses procedures.

## **5.0 PROCEDURE**

### **5.1 Initiation**

- A. Upon receipt of a request for preparation and qualification of a Welding Procedure and/or Welding Technique Sheet the LANL WPA shall initiate a welding Procedure Qualification Traveler (PQT), similar to the typical in Attachment 1.
- B. Part I of the PQT shall be completed to provide the parameters and instructions for welding and testing of the qualification coupon(s).
- C. Procedure Qualification Travelers shall be uniquely identified based on the WPS designation followed by PQT Number.
- D. Upon completion of Part I, the PQT will be forwarded to the designated LANL Weld Test Facility Supervisor (typically) for performance of the qualification test.

### **5.2 Materials**

- A. Materials used in welding procedure qualification shall meet the requirements of References 1, 2, or 3, as applicable, and the provisions of GWS 1-03, *Weld Material Control*. As a minimum, this shall include:
  - 1. Identification and marking in compliance with the material specification.
  - 2. Manufacturer's documentation in compliance with the purchase specification, including certified material test reports for actual chemical and physical tests, where required.
  - 3. Inspection for physical damage, cleanliness, dimensions, weld preparation, and workmanship.

### **5.3 Procedure Qualification Tests**

- A. Qualification tests shall be performed under the technical direction of the LANL FWO WPA. During the test, the LANL WPA shall assure that all required traceability, inspection, performance, and test results are properly recorded on the PQT.
- B. When the facilities, tools and equipment, welding personnel, and/or technical support of a subcontractor are used in support of welding procedure qualification for LANL, the LANL WPA shall assure compliance with the applicable code requirements (e.g., ASME Section IX, QW-201) for subcontracted activities. Subcontractor controls are not required for procedure qualification activities performed on behalf of LANL by other units of the U.S. Department of Energy.
- C. The procedure qualification coupon(s) shall be tested in accordance with the parameters and instructions in Part I of the PQT. Purchase orders for laboratory testing services shall be processed in accordance with LANL procurement requirements. The LANL WPA shall assure that the materials laboratory is qualified for the required scope of services. Qualification criteria for testing laboratories will include the following:
  - 1. Qualified personnel for performance of testing.
  - 2. Available standard test procedures and reference standards, e.g. ASME, ANSI, ASTM, AWS.

3. Established controls to assure purchased material, equipment, and services conform to applicable standards.
  4. Program for maintaining identification and traceability of test coupons.
  5. Calibration standards traceable to national or international standards.
  6. Test equipment maintained and calibrated at sufficient intervals, including supporting records.
  7. Provision for approval of test documentation.
- D. Test results shall be recorded in Part II of the PQT by the WPA. Copies of the materials laboratory test reports, heat treatment chart, etc., shall be included with the PQT package.

#### **5.4 Procedure Qualification Record Documentation**

- A. Upon satisfactory completion of the welding procedure qualification, including satisfactory test data results, the LANL WPA shall prepare and certify a Welding Procedure Qualification Record (PQR), similar to the typical in Attachment 2 or 3, as applicable.
- B. Based on the qualified PQR(s), the LANL WPA shall prepare or revise the associated Welding Procedures, Weld Technique Sheets, and Welder Qualification Tests in accordance with the General Instructions Section of this program.
- C. Revision to PQRs shall require re-certification signature by the WPA. The basis for the revision shall be documented in the procedure qualification file.
- D. PQRs prepared and certified by other DOE sites, by SSS, or other predecessor or contracted organizations may be used in support of the LANL Welding Program when reviewed and approved by the LANL WPA and need not be re-qualified.

#### **5.5 Standard Welding Procedure Specification Demonstration**

- A. The LANL WPA shall assure demonstration of Standard Welding Procedure Specifications (SWPS) prior to use in applications permitted by ASME Section IX.
- B. Standard WPS demonstrations shall be conducted in accordance with ASME Section IX and the corresponding requirements of this procedure, as applicable. A demonstration may be used to support one or more similar SWPSs as permitted by ASME Section IX (see QW-520).
- C. Upon satisfactory completion of the Standard WPS demonstration, including satisfactory examination and test data results, the LANL WPA shall prepare and certify a Standard Welding Procedure Specification Demonstration Record, similar to the typical in Attachment 4. Demonstration records shall be maintained in accordance with section 5.6.

#### **5.6 Procedure Qualification Records Management**

- A. Completed procedure qualification files (PQTs, PQRs, test reports, etc.) shall be maintained by the LANL WPA. The file shall include a copy of any qualification records prepared and certified by other units of the U.S. Department of Energy or LANL subcontractors when used in support of LANL Welding Program.
- B. The LANL WPA shall provide controlled distribution of certified PQRs as necessary to support Facility, Program, or Project welding activities.

## **6.0 ATTACHMENTS**

Attachment 1: Welding Procedure Qualification Traveler (PQT)

Attachment 2: ASME Welding Procedure Qualification Record (PQR)

Attachment 3: AWS Welding Procedure Qualification Record (PQR)

Attachment 4: Standard Welding Procedure Specification Demonstration Record